

### *Abstract*

This invention relates to a multi-wavelength optical disc and an apparatus and method to read or write signal therefor. The multi-wavelength optical disc comprises a substrate and a recording layer comprising various photochromic materials to store more data, and a reflective layer on the recording layer. The apparatus comprises at least one monochromatic sources to generate a monochromatic light beam, each with different wavelengths, a beam combiner to combine the light beams to a coaxial parallel light beam containing various light signals with different wavelengths, and a beam focalizer to focus the light beam on the optical disc. The apparatus also comprises a beam splitter and light detector to read the data recorded on the disc. When the apparatus reads data from the optical disc, the beam receiver receives the light beam reflected by the optical disc, and the beam splitter decomposing the reflected parallel light beam to monochromatic signals with different wavelengths, then the optical detector detects each monochromatic signal.

Fig. 3